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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,825	12/19/2001	Milton Lee Buschbom	TI-31857	8453

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EXAMINER
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VU, QUANG D

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/033,825	<b>Applicant(s)</b> BUSCHBOM, MILTON LEE	
	<b>Examiner</b> Quang D Vu	<b>Art Unit</b> 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21, 29 and 31-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21, 29 and 31-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6, 7, 9-12, 18, 20, 21, 29, 31, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,538,319 to Terui in view of US Patent No. 6,448,640 to Corisis

Regarding claim 1, Terui (figures 1-3C) teaches a substrate for an unpackaged integrated circuit chip having surface mount contacts disposed thereon in a pattern, comprising:

an insulating material (1); and

a conductive material disposed over the insulating material (1), the conductive material comprising a plurality of contacts (2) arranged in a pattern corresponding to the integrated circuit (12) contact pattern (13), the conductive material comprising a conductive ring (4) disposed around the periphery of the contact pattern (2), the conductive material comprising a first trace (3a) connected to the conductive ring (4), wherein the substrate contacts (7) are coupleable to the integrated circuit chip (12) surface mount contacts (13) (column 2, line 12 – column 3, line 12).

Terui differs from the claimed invention by not showing the trace surrounding a selected one of the plurality of contacts. However, Corisis (figures 1-7) teach the trace (200) surrounds one of the plurality of contact pad (24). Therefore, it would have been obvious to one having

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ordinary skill in the art at the time the invention was made to incorporate the teaching of Corisis into the device taught by Terui because it reduces the capacitance of the contact. The combined device shows the trace surrounding a selected one of the plurality of contacts.

Regarding claim 2, Terui teaches the conductive material comprises at least one conductive trace (7) disposed proximate at least one contact (2).

Regarding claim 3, Terui teaches at least one conductive trace (7) is coupled to the conductive material ring (4).

Regarding claim 4, Terui teaches the substrate contacts (7) comprise wire bond pads (3), wherein the wire bond pads (3) are coupleable to the integrated circuit chip (12) surface mount contacts (13).

Regarding claim 6, Terui teaches the insulating material (1) includes a plurality of apertures (5) disposed in the integrated circuit contact pattern (2).

Regarding claim 7, Terui teaches the conductive material comprises Cu (column 2, lines 25-29).

Regarding claim 9, the disclosures of Terui and Corisis are discussed as applied to claim 1 above.

Regarding claim 10, Terui teaches the conductive material comprises at least one conductive trace (7) disposed proximate at least one contact (2).

Regarding claim 11, Terui teaches at least one conductive trace (7) is coupled to the conductive material ring (4).

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Regarding claim 12, Terui teaches the substrate contacts (7) comprise wire bond pads (3), wherein the wire bond pads (3) are coupleable to the integrated circuit chip (12) surface mount contacts (13).

Regarding claim 18, Terui teaches the insulating material (1) includes a plurality of apertures (5) disposed in the integrated circuit contact pattern (2).

Regarding claim 20, Terui teaches the integrated circuit comprises a ball grid array.

Regarding claim 21, Terui teaches an integrated circuit packaged in the package.

Regarding claim 29, the disclosures of Terui and Corisis are discussed as applied to claim 1 above.

Regarding claim 31, the combined device shows the trace surrounding selected one of the plurality of contacts (Corisis; figures 1-7).

Regarding claim 33, the combined device shows the trace surrounding selected one of the plurality of contacts (Corisis; figures 1-7).

Regarding claim 35, the combined device shows the trace surrounding selected one of the plurality of contacts (Corisis; figures 1-7).

3. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terui in view of Corisis, and further in view of US Patent No. 6,075,710 to Lau.

The disclosures of Terui and Corisis are discussed as applied to claims 1-7, 9-12, 18, 20, 21, 29, 31, 33 and 35 above.

Regarding claim 5, Terui and Corisis differ from the claimed invention by not showing the insulating material comprises polyimide. However, Lau teaches the substrate comprises

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polyimide (210) (figure 6; column 7, lines 37-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Lau into the device taught by Terui and Corisis because the polyimide is a resin material for adhesion.

Regarding claim 17, Terui teaches the conductive material comprises Cu (column 2, lines 25-29). Terui and Corisis differ from the claimed invention by not showing the insulating material comprises polyimide. However, Lau teaches the substrate comprises polyimide (210) (figure 6; column 7, lines 37-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Lau into the device taught by Terui and Corisis, since the polyimide is a resin material for adhesion.

4. Claims 8, 13-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terui in view of Corisis, and further in view of US Patent No. 6,150,193 to Glenn.

The disclosures of Terui and Corisis are discussed as applied to claims 1-7, 9-12, 18, 20, 21, 29, 31, 33 and 35 above.

Regarding claim 8, Terui and Corisis differ from the claimed invention by not showing the conductive material is formed by electro-less plating. However, Glenn teaches the conductive material is formed by electro-less plating (column 4, lines 46-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Glenn into the device taught by Terui and Corisis because the electro-less plating is a conventional process for forming conductive layer.

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Regarding claim 13, Terui and Corisis differ from the claimed invention by not showing an encapsulating insulating material disposed over the integrated circuit and substrate. However, Glenn (figure 5) teaches an encapsulating insulating material (208) disposed over the integrated circuit and substrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Glenn into the device taught by Terui and Corisis because it protects the device from damage. The combined device shows an encapsulating insulating material disposed over the integrated circuit and substrate.

Regarding claim 14, Terui and Corisis differ from the claimed invention by not showing a shielding material disposed over the encapsulating insulating material, the shielding material being electrically coupled to the conductive material solid ring. However, Glenn (figure 5) teaches a shielding material (210) disposed over the encapsulating insulating material (208) (column 7, lines 1-13). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Glenn into the device taught by Terui and Corisis because it protects the device from damage. The combined device shows a shielding material disposed over the encapsulating insulating material, the shielding material being electrically coupled to the conductive material solid ring.

Regarding claim 15, the combined device shows the shielding material (210) comprises an electrically conductive material (Glenn; column 7, lines 9-10).

Regarding claim 16, the combined device differs from the claimed invention by not showing the shielding material comprises a dissipative material having less than about 1 M ampere resistance. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the shielding material comprises a dissipative material having less

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than about 1 M ampere resistance because it protects the device from damage. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 19, Terui and Corisis differ from the claimed invention by not showing the conductive material is formed by electro-less plating. However, Glenn teaches the conductive material is formed by electro-less plating (column 4, lines 46-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Glenn into the device taught by Terui and Corisis because the electro-less plating is a conventional process for forming conductive layer.

5. Claims 32, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terui in view of Corisis, and further in view of US Patent No. 6,168,974 to Chang et al.

The disclosures of Terui and Corisis are discussed as applied to claims 1-7, 9-12, 18, 20, 21, 29, 31, 33 and 35 above.

Regarding claims 32, 34 and 36, Terui and Corisis differ from the claimed invention by not showing one of the plurality of contacts is a controlled impedance connection. However, Chang et al. teach the interconnection elements having controlled impedance (column 7, lines 3-14). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Chang et al. into the device taught by Terui and Corisis because the impedance of the connection line can be controlled. The combined device show one of the plurality of contacts is a controlled impedance connection.



***Response to Arguments***

Applicant's arguments with respect to claims 1-21, 29 and 31 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 571-272-1667. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qv  
March 30, 2004

Patent Examiner  
*Steven Loke*